CHANGES TO THE REGULATIONS FOR SAFE TRANSPORT OF RADIOACTIVE MATERIALS

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U.S. NRC / DOT RULEMAKING

- January 26, 2004 Fed. Reg. (69 FR 3632, 3698)
- Effective October 1, 2004
- Objective: Harmonization with IAEA TS-R-1
- Ambiguities and adverse effect on 'alternate feedstock' materials

New Definition of "Radioactive Material"

- Current: 70 Bq/g (2000 pCi/g) as total specific activity
- New: Radionuclide Specific exemption concentrations
- U-nat, Th-nat = 1.0 Bq/g; Ra-226 = 10
 Bq/g
- Exceeding activity concentration AND consignment activity limit = Class 7 (Radioactive)

Why Radionuclide Specific Exemption Values?

- 70 Bq/g = technology-based standard
- ICRP 60, later IAEA BSS 115 "trivial dose" exemption = 1 mrem/yr
- EC transportation model for 20 radionuclides: 70 Bq/g > 1 mrem/yr
- Exemption concentrations reduced for some (but not all) radionuclides

Limitation of Scope of Regulation

The regulations do not apply to:

Natural material and ores containing naturally occurring radionuclides which are not intended to be processed for use of these radionuclides, provided the activity concentration of the material does not exceed 10 times the values specified in § 173.436.

Origins of IAEA Exemption Language

- 1 Bq/g would extend regulation to vast quantities of mineral ores and products
- Bias against "intentional" use of radionuclides, e.g., fuel cycle
- "10 x" exemption = compromise
- Not available to materials "intended to be used" for radionuclide content

Problems with new "radioactive material" definition

- "Intent-based" test for whether a material is radioactive
- Unrelated to level of hazard presented during transportation
- Materials destined for "alternate feedstock" may become Class 7
- Consider: 3 Bq/g U-nat waste for disposal = non-radioactive
- Same material as alternate feed = radioactive

What is "Natural Material?"

- DOT: cement, coal, fertilizers, gypsum, residues from mining, smelting
- Processed minerals = natural materials (provided not processed for rad content)
- How much processing before no longer "natural?"
- What about equilibrium?

Other issues

- For materials not in equilibrium, how does §173.436 footnote (b) apply?
- "Mixture rule" of §173.433?
- Must a generator assess all radionuclide activity concentration in its material?
- Availability of gamma-spec / alpha spec in lieu of complete isotopic analysis?

Going Forward

- DOT / NRC rules must be consistent with but not necessarily identical to IAEA TS-R-1 (49 USC 5120)
- Remove "intent-based" determination of radioactive for domestic US transportation
- NRC/DOT soliciting input on TS-R-1 (69 Fed. Reg. 25656, May 7); comments by June 7
- Guidance needed from DOT/NRC on scope of natural materials
- Stakeholders need to be more proactive with respect to IAEA – what happens in Vienna ultimately affects US regulations